Socioeconomic inequalities in neonatal mortality are falling: but why?

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The estimated number of deaths of children younger than 5 years has dropped from more than 10 million in 2000 to fewer than 7 million at present—a reduction mainly associated with prevention of post-neonatal deaths due to diarrhoea, pneumonia, measles, and other infectious diseases.[1,2] Deaths of newborn babies are proving to be harder to reduce. Even though neonatal mortality rates are falling, they are doing so at a slower pace than deaths of older children, and now represent more than 40% of under-5 mortality.[1,2]

Despite growing interest in neonatal mortality, very little is known about how these rates vary by socioeconomic position in low-income and middle-income countries. In this issue of *The Lancet Global Health*, Britt McKinnon and colleagues[3] present what are probably the first global-level analyses of how such inequalities are evolving over time. They rely on state-of-the-art analyses to describe absolute and relative changes in socioeconomic disparities in neonatal mortality. In most of the 24 countries with available information, both neonatal mortality rates and socioeconomic inequalities in these rates have fallen.

McKinnon and colleagues' results are somewhat surprising in light of what is known about under-5 mortality as a whole. A recent set of analyses[4] showed that, in 38 countries with two surveys with a median interval of 11 years, relative socioeconomic inequalities—assessed through the concentration index—increased in 24 and decreased in 14 countries. However, the magnitude of changes tended to be small, with an average increase in concentration indices over time of only 0·02, indicating a slight upturn in inequalities.[4] An earlier analysis of the 1991–2001 period also found no clear overall pattern of increase or decline over time in socioeconomic inequalities in under-5 mortality.[5]

Time trends in socioeconomic inequalities in child mortality are affected by several factors, including the baseline mortality levels and cause structure, the availability of effective interventions, and the delivery channels used to reach different social groups with such interventions. At the turn of the millennium, it was widely believed that high-technology, hospital-based approaches were essential for preventing neonatal deaths. We now know that, in high-mortality settings, a handful of cost-effective interventions delivered at community level could have a substantial effect on neonatal mortality rates.[1,2] If these interventions are rapidly scaled up to reach the poorest children—who are still dying from easily preventable causes in many countries—then inequalities are likely to be reduced. Results on national changes in coverage of key interventions, however, have been quite disappointing in most countries,[6] so it is not at all clear that increased coverage among the poor could explain the findings of McKinnon and colleagues' article.

There are important methodological issues affecting the study of child mortality inequalities on the basis of survey data. McKinnon and colleagues relied on rigorous analytical tools to study these changes, and in some aspects—for example the graphical display of the statistical significance of changes in inequality indices—their approach was innovative. However, any such analyses cannot avoid the limitations of the underlying data. First, to achieve sufficient sample size by quintiles, the standard practice is to rely on all deaths reported in the 10 years before the survey, which means that the midpoint for each estimate refers to a date that is 5 years before the survey. Second, household assets are measured at the time of the interview, and the family's socioeconomic position at this time might be different from what it was at the time the child died. Third, neonatal deaths are rare events in statistical terms—even more so than all under-5 deaths—meaning that the precision of the estimates is low. Nevertheless, survey data are the best currently available for national-level estimates, so one has to live with these limitations. But one cannot help wondering whether these limitations explain why socioeconomic disparities in more precisely measured outcomes—such as child stunting[7] or coverage of interventions such as skilled birth attendants[8]—tend to be much more marked than those for mortality rates.

As is the case for most good pieces of research, this paper raises as many, if not more, questions than it answers. How can we improve measurement of mortality rates to avoid the methodological pitfalls described above? If inequalities in under-5 mortality

are not being reduced but those in neonatal mortality are falling, might this be explained by increased inequalities in post-neonatal deaths? Will countries with reduced inequalities continue to perform equally well when neonatal mortality declines and further reduction becomes dependent on more sophisticated interventions such as surfactant therapy or neonatal care units? Which types of health policy, programme, intervention, and delivery channel were most strongly related to improved equity in mortality? The Every Newborn Action Plan will be launched in mid-2014, and is already receiving wide attention. Continued monitoring of inequalities in newborn intervention coverage and mortality rates must be a key aspect of any such strategy for reaching every mother and newborn.

For the **Every Newborn Action Plan** see http://www.everynewborn.org/

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